GeoLogic Associates
Geologists, Hydrogeologists and Engineers

December 20, 2006
Project No. 2006-0199

Mr. Don L. Jenkins
5530 Brookmead Drive
Whittier, CA 90601

GEOLOGIC/GEOTECHNICAL RECONNAISSANCE REPORT
DPLU CASE NUMBER TPM21023/ER
18040 QUAIL DRIVE
PAUMA VALLEY, CALIFORNIA

In accordance with your request and authorization, GeoLogic Associates (**GLA**), has conducted a geologic/geotechnical reconnaissance of the site at 18040 Quail Drive in Pauma Valley, California (see Figure 1 – Vicinity Map).

1.0 INTRODUCTION

This report presents the results of our geologic/geotechnical reconnaissance of the site at 18040 Quail Drive in Pauma Valley, CA. The purpose of our evaluation was to evaluate the existing geologic/geotechnical conditions present at the site and to provide planning-level conclusions relative to the proposed improvement of the site. Our scope of services is as follows:

- Review of available pertinent, published and unpublished geotechnical literature.
- A geotechnical reconnaissance of the site.
- Compilation and analysis of the geotechnical data obtained from the field reconnaissance.
- Preparation of this report.

1.1 Site Location and Description

The site is Parcel Number 132-220-18 and is comprised of two Parcels. Parcel 1 is 5.1 acres and Parcel 2 is 5.25 acres. A 4 bedroom single-family residence is proposed on the southern half of the property (Parcel 1) located on 5.1 acres. The site is currently an orchard located on the southwest-facing flank of the northwest-southeast trending Palomar Mountain (Figure 2). The

elevation of the site (Parcels 1 and 2) ranges from 1740 to 1865 feet mean sea level. Two structures currently exist on the site.

2.0 SUMMARY OF GEOTECHNICAL CONDITIONS

2.1 Regional Geology

The subject site is located in a mountainous area of the Peninsular Ranges Geomorphic Province of California. This site is near the Palomar Mountain area and the Elsinore Fault Zone. The area is characterized by steep ridges and broad valleys composed of alluvial/colluvial materials deposited on the Cretaceous igneous basement complex.

2.2 Site Geology

The project area is located in a moderately-sloping alluvial fan-type feature composed of eroded materials of the adjacent granitic rock. Two drainages of the Yuima Creek flank each side of the southwestern-facing slope.

The project site is underlain by Quaternary (Pleistocene) alluvium deposited on the irregular erosional surface of the crystalline basement rock (Figure 3). The depth of the alluvium on the site in unknown. The crystalline bedrock is locally known as a Cretaceous Tonolite (Rogers, 1986). These rocks were intruded with the plutonic rocks of the Southern California batholith. The batholithic rock intrusion occurred in several episodes, producing igneous bodies of slightly different composition (plutons). The Cretaceous Tonalite is described as medium-grained, slightly to highly weathered, moderately to highly fractured.

2.3 Groundwater

Groundwater is anticipated to be several hundred feet below the existing ground surface on site. Groundwater is expected to be flowing below the site within the fractured granitic rock. Review of well information in the area of the site indicates a well approximately 1,900 feet downgradient from the southern portion of the site (Well No. 24) has a water depth ranging from 225 to 360 feet below the existing ground surface in this area (Appendix A). The well head is approximately 200 feet below the elevation at the subject site. Considering the proximity of the well to the site, it is reasonable to assume that the groundwater at the subject site is also several hundred feet below the existing ground surface. A plan view and oblique view of the property and well location are presented in Figures 2 and 4.

3.0 FAULTING AND SEISMICITY

3.1 Faulting

Our discussion of faults on the site is prefaced with a discussion of California legislation and policies concerning the classification and land-use criteria associated with faults. By definition of the California Geological Survey, an active fault is a fault that has had surface displacement within Holocene time (about the last 11,000 years). The state geologist has defined a potentially active fault as any fault considered to have been active during Quaternary time (last 1,600,000 years). This definition is used in delineating Earthquake Fault Zones as mandated by the Alquist-Priolo Geologic Hazards Zones Act of 1972 and as subsequently revised in 1975, 1985, 1990, 1992, and 1994. The intent of this act is to assure that unwise urban development and certain habitable structures do not occur across the traces of active faults. The subject site is not included within any Earthquake Fault Zones as created by the Alquist-Priolo Act.

Our review of available geologic literature (Section 6.0) indicates that there are no known major or active faults on the site. The nearest active regional faults are Julian segment of the Elsinore Fault Zone, the Earthquake Valley Fault, and the San Jacinto Fault. Our seismic analysis is presented in Appendix B.

3.2 Seismicity

The site can be considered to lie within a seismically active region, as can all of Southern California. Table 1 identifies potential seismic events that could be produced by the maximum credible earthquake event.

Table 1
Seismic Parameters for Active Faults (Blake, 2004a and 2004c)

Fault Zone (Seismic Source)	Distance to Site (miles)	Maximum Earthquake Event		Design Earthquake (CBC, 2001)
		Moment Magnitude	Peak Horizontal Ground Acceleration (g)	Peak Horizontal Ground Acceleration (g)
Elsinore-Julian	1.3	7.1	0.62	0.5
Earthquake Valley	22.4	6.5	0.11	
San Jacinto	23.9	7.2	0.15	

The maximum earthquake is defined by the State of California as the maximum earthquake that appears capable of occurring under the presently understood tectonic framework. Site-specific seismic parameters included in Table 1 are the distances to the causative faults, earthquake magnitudes (Mw), and expected ground accelerations, which were determined with EQFAULT software (Blake, 2004a).

From a deterministic approach (assuming an earthquake event on the nearest point of the nearest fault to the site), as indicated in Table 1, the Elsinore-Julian Fault is the active faults considered to have the most significant effect at the site from a design standpoint. The maximum earthquake on this fault having a 7.1 moment magnitude can generate a peak horizontal ground acceleration of 0.62g at the project site.

From a probabilistic standpoint (considering the most likely earthquake event to affect the site based on the fault activity/return period of all the faults in the neighborhood of the site), the design ground motion (per CBC, 2001/UBC, 1997) is defined as the ground motion having a 10 percent probability of exceedence in 50 years (475-year return period). This ground motion is referred to as the design earthquake. The design earthquake ground motion at the site is predicted to be 0.5g. The effect of seismic shaking may be mitigated by adhering to the California Building Code and state-of-the-art seismic design parameters of the Structural Engineers Association of California.

Secondary effects associated with severe ground shaking following a relatively large earthquake on a regional fault that may affect the site include ground rupture, soil liquefaction and dynamic settlement, seiches and tsunamis. These secondary effects of seismic shaking are discussed in the following sections.

3.3 Historical Seismicity

The historic record of earthquakes in southern California for the past 200 years has been reasonably well established. More accurate instrumental measurements have been available since 1933. Based on recorded earthquake magnitudes and locations, the area may be vulnerable to moderate seismic ground shaking during the design life of the project.

3.4 Ground Surface Rupture

Since no active faults are known to transect the site, ground surface rupture as a result of movement along known faults is considered unlikely.

3.5 Liquefaction and Dynamic Settlement

Liquefaction is a phenomenon in which soils lose shear strength for short periods of time during an earthquake, which may result in very large total and/or differential settlements for structures founded on liquefying soils. In order for the potential effects of liquefaction to be manifested at the ground surface, the soils generally have to be granular, loose to medium dense, saturated relatively near the ground surface, and must be subjected to a sufficient magnitude and duration of shaking. Based on the State of California Special Publication 117, "Guidelines for Analyzing and Mitigating Liquefaction", the standard depth for evaluating liquefaction potential is 50 feet below the existing ground surface per the following excerpt:

"It is recommended that a minimum depth of 50 feet (15 m) below the existing ground surface or lowest proposed finished grade (whichever is lower) be investigated for liquefaction potential."

Accordingly, due to the lack of a near-surface groundwater table (upper 50 feet) and the relatively dense nature of the site alluvial soils and granitic rock, the potential for large-scale liquefaction effects (Ishihara, 1985) to the proposed surface improvements is negligible.

It should also be understood that much of Southern California is an area of moderate to high seismic risk and is not generally considered economically feasible to build structures totally resistant to earthquake related hazards. However, current state-of-the-art standards for design and construction are intended to reduce the potential for major structural damage.

3.6 Landslides

The site is located in a very gently sloping area and the underlying soil materials are very competent materials and rock. Accordingly, the potential for landslides or other slope instability problems is considered low.

3.7 Tsunamis and Seiches

Given the large distance away from the nearest large body of water and the elevation of the site, the potential for a tsunami (tidal wave) or seiche is negligible.

4.0 PLANNING-LEVEL CONCLUSIONS

Based on the results of our geologic/geotechnical reconnaissance, it is our opinion that the site may be affected by a moderate to high horizontal site acceleration as a result of the design earthquake event but there is a very low potential for ground rupture, liquefaction, and landsliding at the site.

Based on the results of **GLA**'s study, it is our opinion that the proposed development is feasible from a geologic/geotechnical perspective.

5.0 LIMITATIONS

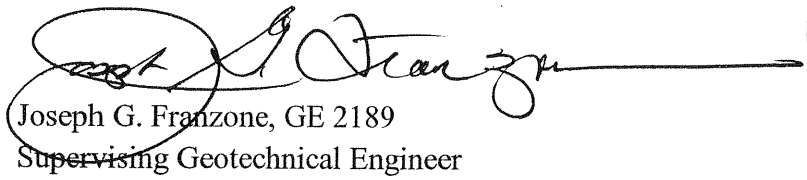
The conclusions and recommendations in this report are based in part upon data that were obtained from a limited number of observations and site visits. The nature of many sites is such that differing geotechnical or geological conditions can occur within small distances and under varying climatic conditions. Changes in subsurface conditions can and do occur over time.

This document has not been prepared for use by parties or projects other than those named or described above, as it may not contain sufficient information for other parties or other purposes. The report has been prepared in accordance with generally accepted geotechnical practices and makes no other warranties, either express or implied, as to the professional advice or data included.

This report is valid for a period of two years from the date of publication. A review of the findings and recommendations contained in this report is required if construction is delayed beyond the two-year period.

We appreciate this opportunity to be of service. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

GeoLogic Associates



Joseph G. Franzone, GE 2189
Supervising Geotechnical Engineer

Distribution: (2) Addressee
(4) Mr. Brian Polley
Brian Polley Land Surveying
656 Metcalf Street
Escondido, CA 92025

Attachments: Figure 1 – Vicinity Map
Figure 2 – Site Location Map
Figure 3 – Geologic Map
Figure 4 – Oblique View of Site
Appendix A – Letter from the Yuima Municipal Water District
Appendix B - Seismic Analysis

6.0 REFERENCES

Blake, Thomas F., 2000a, EQFAULT, Version 3.00, Deterministic Estimation of Peak Acceleration from Digitized Faults.

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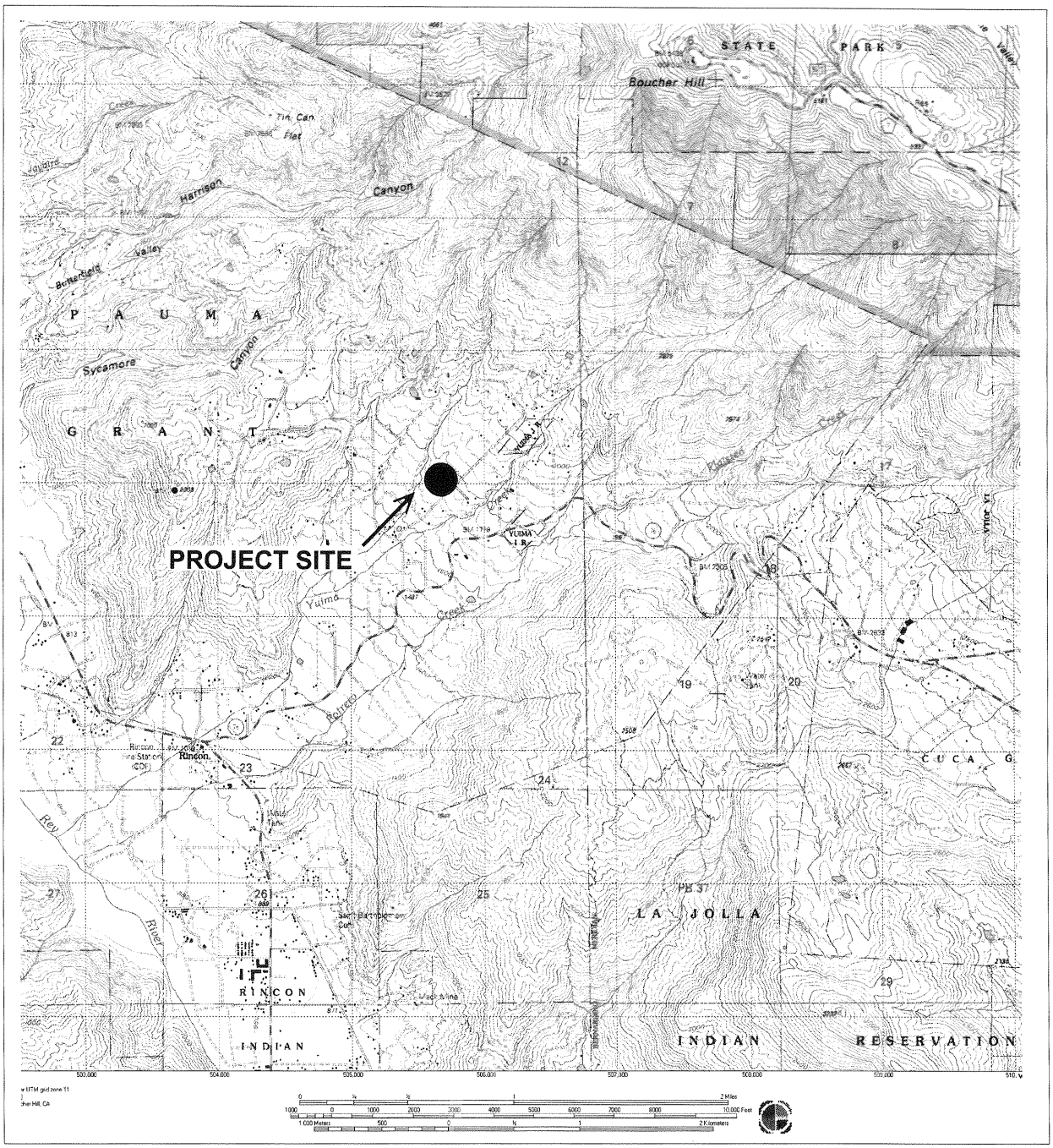

REFERENCE: U.S.G.S. 7.5 Minute Topographic Series, Boucher Hill, CA, 1997.

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FIGURE 1

VICINITY MAP

DON L. JENKINS
18040 QUAIL DRIVE
PAUMA VALLEY, CA

GeoLogic Associates
Geologists, Hydrogeologists, and Engineers

Draft	Date	Project No.
JGF	10/2006	2006-170

REFERENCE: Google Earth, 2006.

APPROXIMATE SCALE

1 INCH = 330 FEET

FIGURE 2

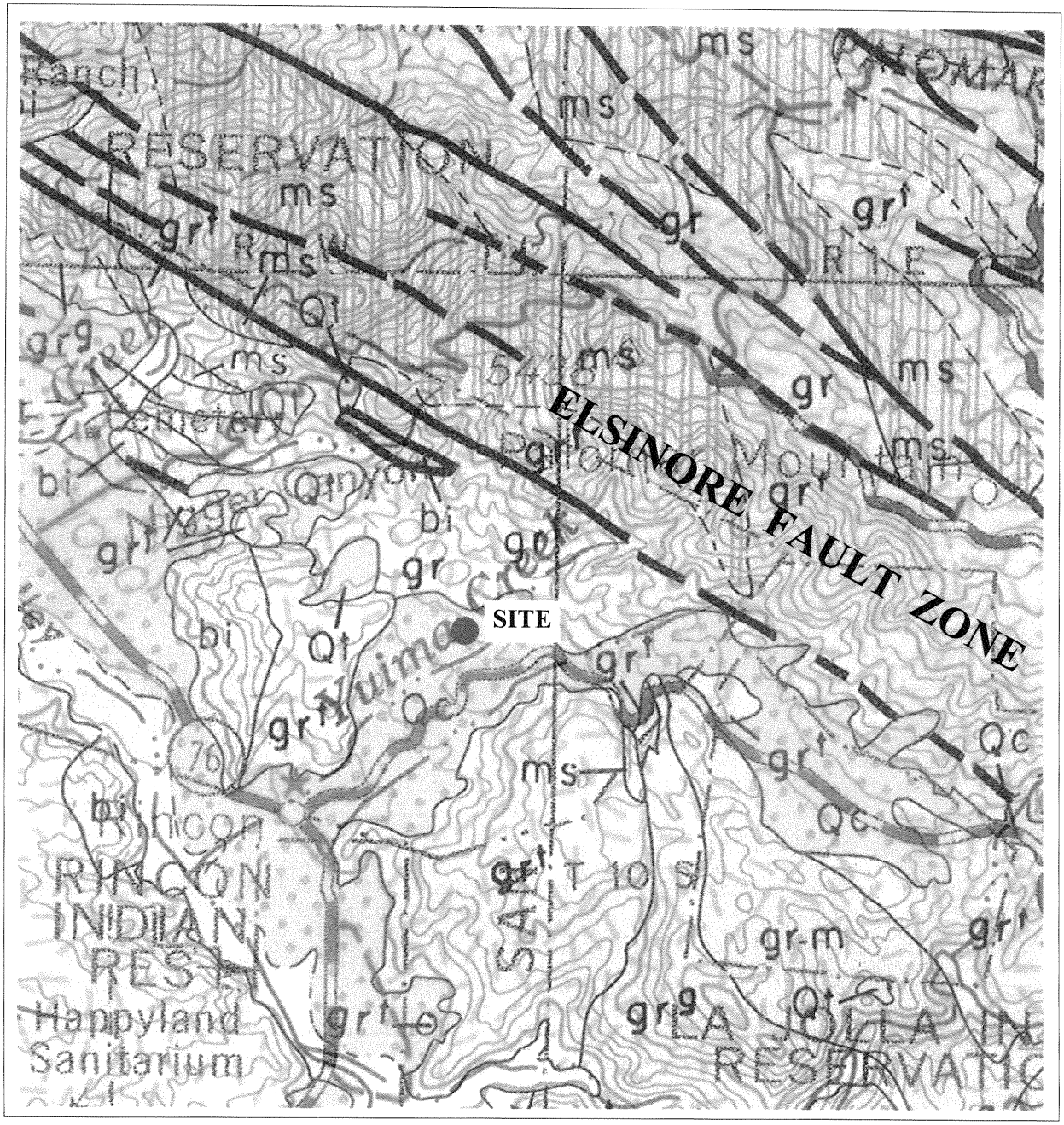
N

SITE MAP

DON L. JENKINS
18040 QUAIL DRIVE
PAUMA VELLEY, CA

GeoLogic Associates
Geologists, Hydrogeologists, and Engineers

Draft	Date	Project No.
JGF	12/2006	2006-170



REFERENCE: Rogers, 1986, 5th Printing.

APPROXIMATE SCALE

1 INCH = 1,200 FEET

N

LEGEND

Qc	**Quaternary Non-marine Deposits**
gr ^{t}	**Mesozoic Granitic Rock-Tonolite**
	Elsinore Fault

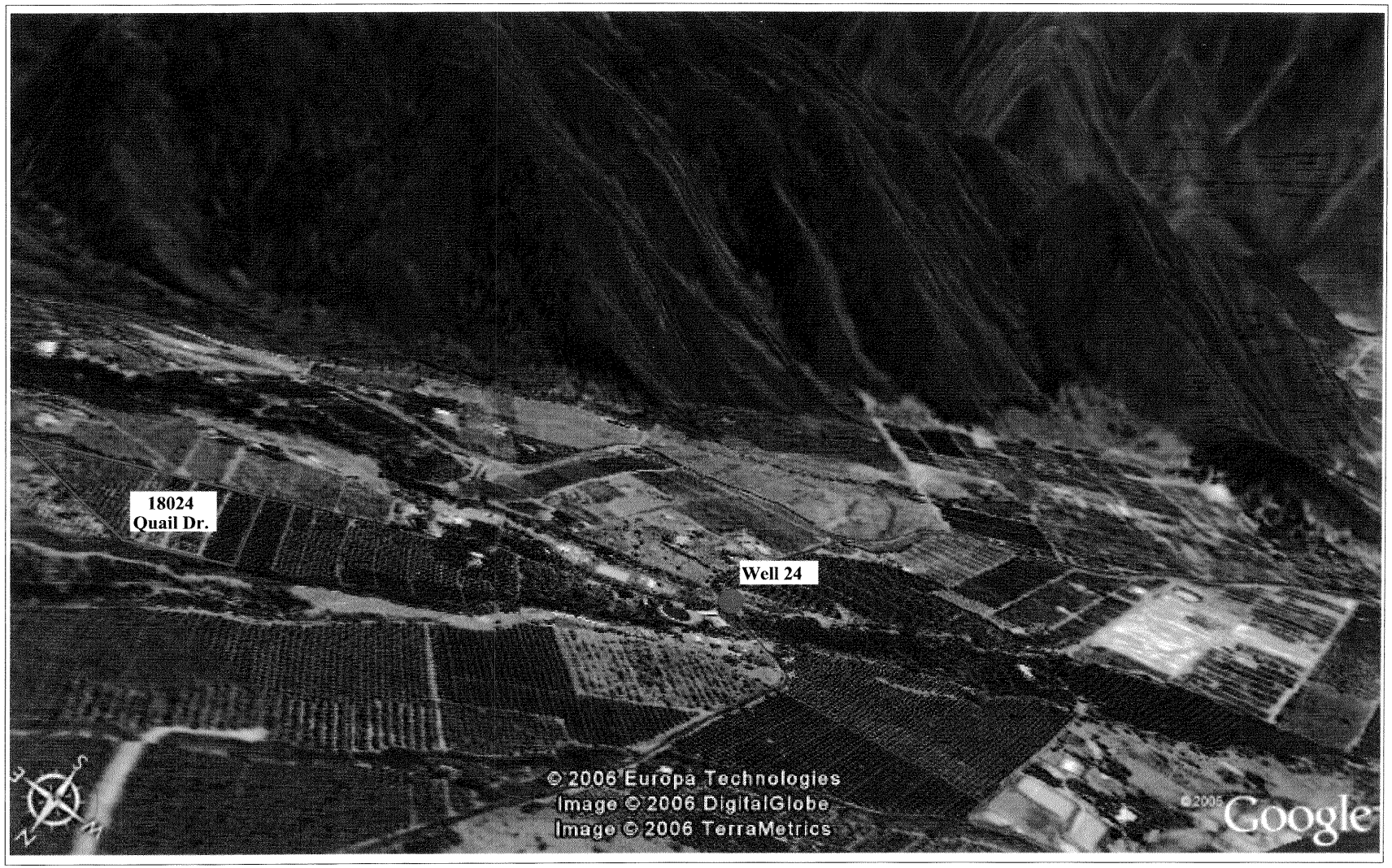
FIGURE 3

SITE MAP

DON L. JENKINS
18040 QUAIL DRIVE
PAUMA VELLEY, CA

GeoLogic Associates
Geologists, Hydrogeologists, and Engineers

Draft	Date	Project No.
JGF	12/2006	2006-170



REFERENCE: Google Earth, 2006.

APPROXIMATE SCALE

1 INCH = 600 FEET

FIGURE 4

SITE MAP

DON L. JENKINS
18040 QUAIL DRIVE
PAUMA VELLEY, CA

GeoLogic Associates
Geologists, Hydrogeologists, and Engineers

Draft	Date	Project No.
JGF	12/2006	2006-170

APPENDIX A

LETTER FROM THE YUIMA MUNICIPAL WATER DISTRICT

Yuima Municipal Water District

34928 Valley Center Rd. Pauma Valley, CA 92061
P.O. Box 177 Pauma Valley, CA 92061
Phone 760-742-3704 Fax 760-742-2069
E-Mail yuimamwd@direcway.com

11/22/06

Don Jenkins
5530 Brookmead Dr.
Whittier, CA 90601

RE: Water level in well 24

Dear Don,

I reviewed our records of water levels for the District Well #24 located approximately 2000' south west of your property and at a well head elevation of 1530' MSL.

The standing water level in the well was reviewed for the months of January, June and November for each of the years of 2002 through 2006 the results are as follows;

Month-year	feet down hole to water
Jan, 2002	344
June, 2002	225
Nov, 2002	349
Jan, 2003	228
June, 2003	359
Nov, 2003	287
Jan, 2004	234
June, 2004	319
Nov, 2004	255
Jan, 2005	243
June, 2005	243
Nov, 2005	318
Jan, 2006	239
June, 2006	312
Nov, 2006	314

Don, these levels represent both pumping and static levels at various times, January is usually static.

If you need any further info please feel free to call.

Regards,

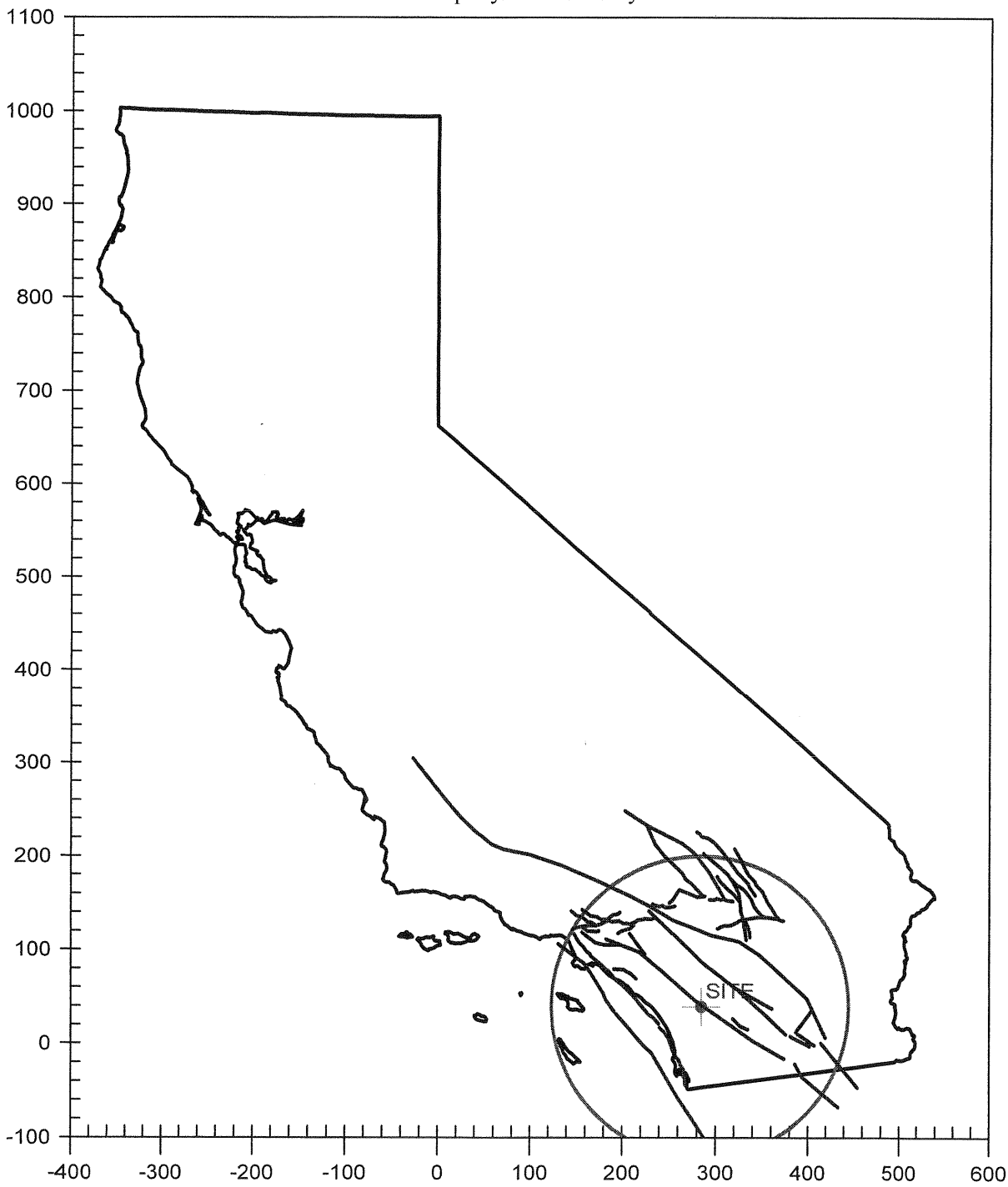
Robert Fowler, Director of Operations and Maintenance

APPENDIX B

SEISMIC ANALYSIS

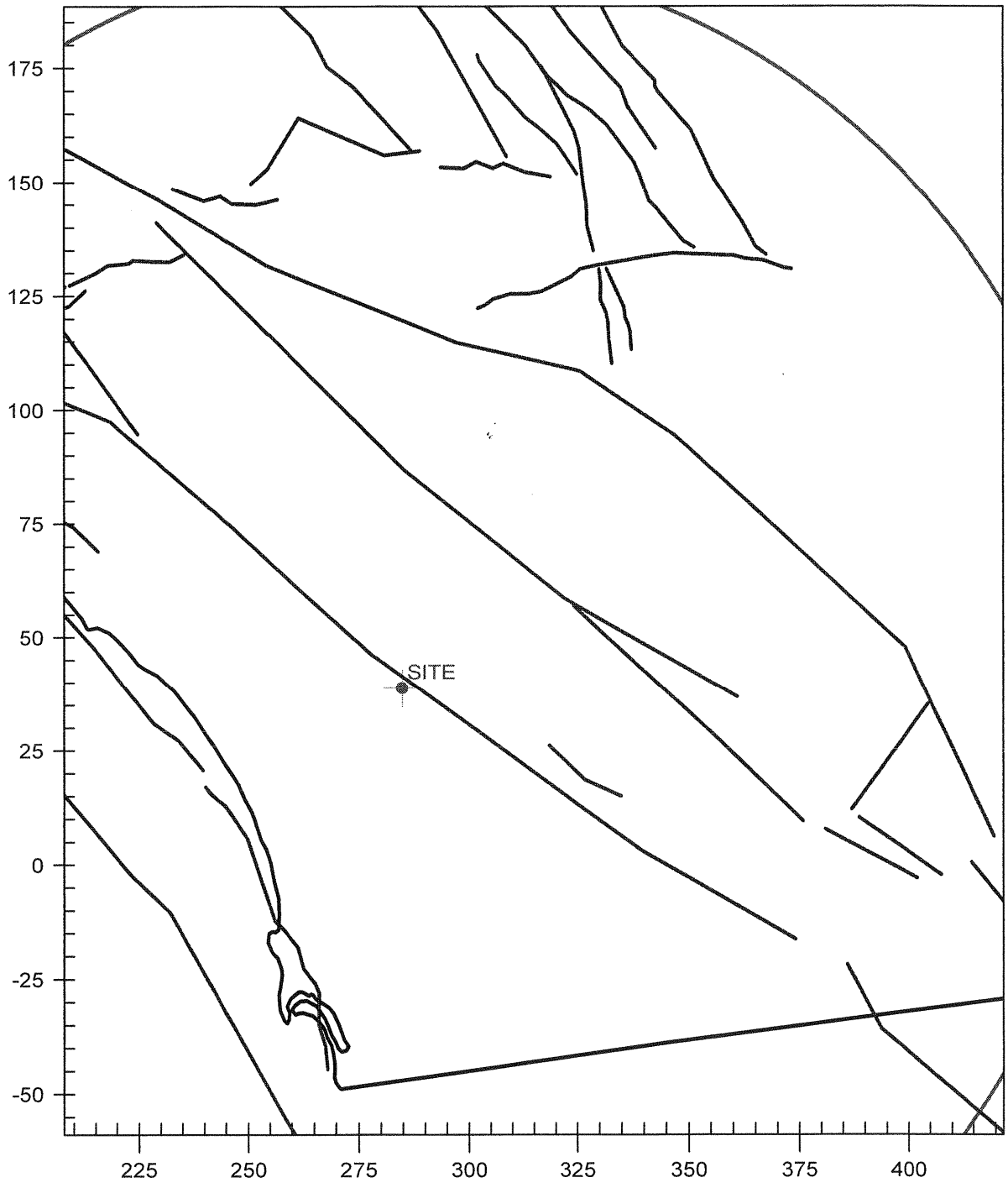
CALIFORNIA FAULT MAP

Jenkins Property/Pauma Valley



CALIFORNIA FAULT MAP

Jenkins Property/Pauma Valley



DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG.(Mw)	ESTIMATED MAX. EARTHQUAKE EVENT: PEAK SITE ACCEL. g	ESTIMATED MAX. EARTHQUAKE EVENT: EST. SITE INTENSITY MOD.MERC.
HELENDALE - S. LOCKHARDT	73.6(118.5)	7.3	0.067	VI
LENWOOD-LOCKHART-OLD WOMAN SPRGS	74.4(119.8)	7.5	0.074	VII
JOHNSON VALLEY (Northern)	74.9(120.5)	6.7	0.048	VI
SAN ANDREAS - Cho-Moj M-1b-1	75.2(121.0)	7.8	0.086	VII
SAN ANDREAS - 1857 Rupture M-2a	75.2(121.0)	7.8	0.086	VII
SAN ANDREAS - Mojave M-1c-3	75.2(121.0)	7.4	0.069	VI
PISGAH-BULLION MTN.-MESQUITE LK	78.7(126.6)	7.3	0.063	VI
CALICO - HIDALGO	82.5(132.7)	7.3	0.061	VI
CLAMSHELL-SAWPIT	83.1(133.7)	6.5	0.049	VI
IMPERIAL	83.8(134.8)	7.0	0.052	VI
RAYMOND	84.8(136.4)	6.5	0.048	VI
UPPER ELYSIAN PARK BLIND THRUST	85.3(137.2)	6.4	0.045	VI
VERDUGO	90.3(145.4)	6.9	0.056	VI
HOLLYWOOD	93.3(150.2)	6.4	0.042	VI

-END OF SEARCH- 54 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE ELSINORE (JULIAN) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.3 MILES (2.1 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.6169 g

PROBABILITY OF EXCEEDANCE

BOORE ET AL(1997) NEHRP D (250)2